

REMARKS

Claims 1-19 are pending in the application. Claims 1-4, 7, 9-11, 13, and 18-19 have been amended and claim 20 has been added. Claims 1-19 were rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. Claims 1-19 were also rejected under 35 U.S.C. 112, second paragraph, for indefiniteness and for omitting essential structural cooperative relationships of elements. Claims 1 and 2 were rejected under 35 U.S.C. 102(b) in view of Masuda '848. Claims 3-19 were rejected under 35 U.S.C. 103(a) over Masuda '848 in view of Pitts '317.

1. Changes to the Specification

The table on pages 2-3 has been amended to include serial numbers of applications related to the instant application as references therein. The paragraph on page 10 has been amended to define more clearly the preferred closed wire loop configuration as previously illustrated in Figure 4. It is submitted that these amendments are supported by the application as originally filed and adds no new matter.

2. 35 U.S.C. 112, First Paragraph Rejections

The Office Action explains claims 1-19 were rejected as one of ordinary skill in the art would not understand the functionality of the cable on the structure from limitations of the claims nor from the specification since the applicant lacks the details about the feature on the disclosure. However, a

“cable” is not a claimed feature. Accordingly, Applicant respectfully traverses the rejection under Section 112, first paragraph.

3. 35 U.S.C. 112, Second Paragraph Rejections

a) Rejection of Claims 1-19 for Indefiniteness.

The Office Action rejected claims 1-19 for lack of clarity in the meaning of the term “dedusting.” Claims 1 has been amended to recite a dust repelling unit for a laser optical element in place of a dedusting unit for a laser optical element. The specification at page 11, lines 21-31 provide support for this amendment. In particular, the specification provides at lines 29-31:

[T]he previously nonelectrostatically charged dust particles are charged by the electric field with the high filed gradient generated by the wire loop 302 and the then [sic] the charged particles are pushed off.

Thus, the device of claim 1 repels dust particles charged by the electric field generated by the device. Claims 2, 3, 4, 7, 10, 11, 13, 18 and 19 have been similarly amended. Therefore, it is submitted that the claim amendments are supported by the application as originally filed and adds no new matter.

b) Rejection of Claim 1-19 for Omitting Essential Structural Cooperative Relationships of Elements.

The Office Action rejected claims 1-19 for omitting structural cooperative relationships between the dedusting unit, high-voltage duct and wire loop.

Applicant submits each of the claims includes the necessary structural relationships of elements. First, each of claims 1-19 recites a dust repelling unit (previously recited as dedusting unit) comprising a high-voltage duct and a wire loop. Hence, the structural relationship as between the dedusting unit and the high-voltage duct, and as between the dedusting unit and the wire loop exist. Second, the structural relationship between the high-voltage duct and the wire loop are present in each of the claims. For example, claim 1 recites:

a *high-voltage duct* comprising a high-voltage conducting core having a first end and a *second end* and an insulator element disposed around the core, the first end of the core being connectable to a high voltage power supply; and

a closed *wire loop* **electrically connected** to the *second end* of the high-voltage core.

The structural relationship is properly defined as the wire loop being electrically connected to the second end of the high-voltage core.

Similarly, claims 4, 13, 18 and 19 each recite a dust repelling unit (previously recited as dedusting unit) comprising a high-voltage duct comprising, among other things, a second end and a wire loop electrically connected to the second end of the high-voltage core. Therefore, applicant respectfully traverses the rejection of claims 1-19 under Section 112, and submit that these claims comply with the requirements of Section 112.

4. Claims 1-3

Claim 1 has been amended to clarify the wire loop as follows:

a **closed** wire loop electrically connected to the second end of the high-voltage core.

In contrast, Masuda '848 is directed to a pulse power supply for generating short pulse high voltages for use with various devices, for example, a Boxer-Charger that provides charge to dust particles. See, col. 1, lines 6-13. Masuda '848 describes a prior art pulse forming unit where the generated pulse high voltage is transmitted through a high-voltage coaxial cable 9 to load 12. See, col. 2, lines 19-33 and Figure 1. The pulse forming unit of Masuda '848 has a high voltage cable 9 that includes a core wire 22, through which the terminal voltage of the pulse forming unit 5 is transmitted to load 12. See, col. 7, lines 44-62 and Figure 2. Masuda '848 also describes the pulse forming unit as applied to operate a Boxer-Charger that includes double helical electrodes through a wire, the outer conductor of a coaxial cable, a wire, a terminal, and a wire. See, col. 9, line 62 – col. 10, line 3. However, the circuit diagrams illustrated in Figures 1, 2 and 5 provide for devices having a wire internal to the coaxial cable for transmitting the pulse and a conductor on the outer portion of the coaxial cable for the return. The return wire is not connected to the internal wire. Thus, the devices illustrated in Figures 1, 2, and 5 fails to disclose a closed wire loop electrically connected to the second end of the high-voltage core.

Further, each of the devices disclosed in Masuda '848 does not describe a wire loop as the wire is interrupted by a connection to a load 12, in the case of the device of Figures 1 and 2, or by a set of helical electrodes, in the case of the device of Figure 5.

To anticipate a claim, a reference must teach every element of the claim. MPEP §2131.01. Since Masuda '848 does not disclose a closed wire loop electrically connected to the second end of the high-voltage core, claim 1 is not anticipated thereby.

It is further submitted that claim 1 is non-obvious over Masuda '848 alone or in combination with any other item of record. Masuda '848 does not disclose a high-voltage duct comprising a high-voltage conducting core having a first end and a second end and an insulator element disposed around the core, the first end of the core being connectable to a high voltage power supply, and a closed wire loop electrically connected to the second end of the high-voltage core. Such a configuration, among other things, advantageously provides a simple device for preventing dust from teaching an optical element of a laser tube. Because the construction is very simple, the dust repelling unit may be readily mounted in front of the mirrors and windows in the tube of a gas laser. None of the cited items disclose or suggest such a combination. Thus, it is submitted that claim 1 is non-obvious and allowable.

Claims 2 and 3, depending on claim 1, should also be allowable in part as depending upon an allowable base claim.

5. Claims 4-19

Claims 4, 13, 18 and 19 each includes the limitation of a "closed wire loop electrically connected to the second end of the high-voltage core." As described above, Masuda '848 does not disclose a closed wire loop. Pitts '317 also fails to disclose this limitation. Pitts '317 describes an electrostatic generator including a ceramic tube 12 that has its interior surface 18 lined with a layer of conductive material 20, such as aluminum or copper foil in intimate contact with the interior surface 18. See, col. 6, lines 20-37. A high-voltage cable 24 is electrically connected to the conductive material 20 coated on the inside of the tube 12. See, col. 6, lines 38-40. A conductive

bushing 26 attached to the cable 24 may be press-fitted or otherwise connected to the conductive material 20. See, col. 6, lines 41-45. Pitts '317 does not mention a wire loop much less a closed wire loop electrically connected to the second end of the high-voltage core. Thus, a *prima facie* case of obviousness cannot be made as even the combination of Masuda '848 and Pitts '317 does not include all the elements of claims 4, 13, 18 and 19.

Claims 5-12, depending on claim 4, should also be allowable in part as depending upon an allowable base claim.

Claim 14-17, depending on claim 13, should also be allowable in part as depending upon an allowable base claim. Further, claim 14 includes the limitation wherein the desired form is a circular form. Such a feature is not disclosed in Masuda '848 or other cited patents.

6. New claim 20

New claim 20, depending on claim 1, should also be allowable in part as depending upon an allowable base claim.

7. Conclusion

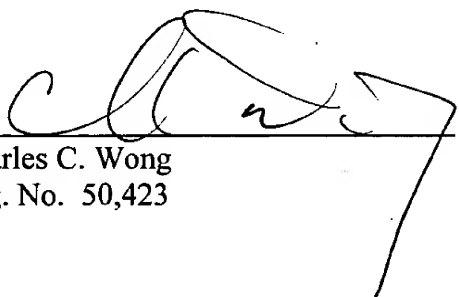
Therefore, it is respectfully submitted that claims 1-20 are allowable and a Notice of Allowance is earnestly solicited.

Respectfully submitted,

LYON & LYON LLP

Dated: August 9, 2002

633 West Fifth Street, Suite 4700
Los Angeles, California 90071-2066
(213) 489-1600

By: 
Charles C. Wong
Reg. No. 50,423

Version of Amendment With Markings to Show Changes Made to the Specification

The Table on pages 2-3 of the specification:

Docket No.	Title	Inventors	Filing Date	Serial or Patent No.
249/300	Gas Laser Discharge Unit	Claus Strowitzki and Hans Kodeda	February 22, 2000	<u>09/510,539</u>
249/301	A Gas Laser and a Dedusting Unit Thereof	Hans Kodeda, Helmut Frowein, Claus Strowitzki, and Alexander Hohla	February 22, 2000	<u>09/511,649</u>
249/303	Shadow Device for A Gas Laser	Claus Strowitzki and Hans Kodeda	February 22, 2000	<u>09/510,017</u>
249/304	Modular Gas Laser Discharge Unit	Claus Strowitzki and Hans Kodeda	February 22, 2000	<u>09/510,538</u>
250/001	Adjustable Mounting Unit for an Optical Element of a Gas Laser	Hans Kodeda, Helmut Frowein, Claus Strowitzki, and Alexander Hohla	February 22, 2000	<u>09/511,648</u>
250/002	An Optical Element Holding and Extraction Device	Hans Kodeda and Helmut Frowein	February 22, 2000	<u>09/510,666</u>

On page 10, lines 17-22:

Referring to Figures 4 and 5, the dedusting unit 115 comprises a high-voltage duct 301 and a wire loop 302. Preferably, the wire loop 302 is a circular closed loop as illustrated in Figure 4.

High-voltage duct 301 comprises a high-voltage conducting core 304 and an insulator element 303 disposed around the core. One end of the high-voltage core is connectable to high-voltage power supply (not shown) and a second end is electrically connected to the wire loop [303] 302. Preferably, insulator element 303 is made out of a ceramic material.

Version of Claims with Marking to Show Changes Made

1. (Amended) A dust repelling [dedusting] unit for a laser optical element, comprising:

a high-voltage duct comprising a high-voltage conducting core having a first end and a second end and an insulator element disposed around the core, the first end of the core being connectable to a high voltage power supply; and

a closed wire loop electrically connected to the second end of the high-voltage core.

2. (Amended) A [dedusting] dust repelling unit [according to] of claim 1, wherein the high-voltage duct comprises a coaxial duct.

3. (Amended) A [dedusting] dust repelling unit [according to] of claim 2, wherein the insulator element of the high-voltage duct comprises a cylindrical ceramic tube and the core is coaxially disposed within the ceramic tube.

4. (Amended) A gas laser, comprising:
a tube having a first end wall at one end and a second end wall at the other end and defining a cavity for containing a laser gas;

an elongated high voltage electrode within the tube and extending parallel to the longitudinal axis of the tube;

an elongated ground electrode within the tube, the ground electrode extending parallel to the high voltage electrode and being spaced apart from the high voltage electrode to thereby define a gas discharge gap therebetween;

a laser resonating path in axial alignment with the gas discharge gap;

a first laser optical element disposed in the laser resonating path and having a first side exposed to the cavity formed by the tube; and

a dust repelling [dedusting] unit comprising (1) a high-voltage duct comprising a high-voltage conducting core having a first end and a second end and an insulator element disposed around the core, the first end of the core being connectable to a high voltage power supply, and (2) a closed wire loop electrically connected to the second end of the high-voltage core; wherein

the dust repelling [dedusting] unit is mounted to the laser tube so that the wire loop is disposed inside the tube in proximity to the first side of the optical element, and the wire loop is transverse to the resonating path so that the resonating path passes through the wire loop.

7. (Amended) A gas laser according to claim 6, further comprising:

a second optical element disposed in the laser resonating path and mounted on the second end wall of the laser tube, wherein the second optical element includes a first side exposed to the cavity formed by the tube, and the second optical element is selected from the group consisting of a completely reflective mirror, a partially transparent, partially reflective mirror, and a fully transparent window; and

a second [dedusting] dust repelling unit mounted to the laser tube so that the wire loop is disposed inside the tube in proximity to the first side of the second optical element, and the wire loop is transverse to the resonating path so that the resonating path passes through the wire loop.

9. (Amended) A[n] gas laser according to claim 5, wherein the insulator element of the high-voltage duct comprises a cylindrical ceramic tube and the core is coaxially disposed within the ceramic tube.

10. (Amended) A gas laser according to claim 4, wherein the high voltage duct of the [dedusting] dust repelling unit extends through the first end wall.

11. (Amended) A gas laser according to claim 6, wherein the high voltage duct of the [dedusting] dust repelling unit extends through the first end wall.

13. (Amended) A method for installing a [dedusting] dust repelling unit for a laser optical element of a gas laser comprising a tube having a first end wall at one end and a second end wall at the other end and defining a cavity for containing a laser gas, a laser resonating path substantially parallel to the longitudinal axis of the tube and along which coherent light can resonate, and a laser optical element having a first side exposed to the cavity formed by the tube, the laser optical element being mounted to the first end wall so that the first side of the optical element is disposed in the laser resonating path, and wherein the [dedusting] dust repelling unit for the optical element comprises (1) a high-voltage duct comprising a high-voltage conducting core having a first end and a second end and an insulator element disposed around the core, the first end of the core being connectable to a high voltage power supply, and (2) a closed wire loop electrically connected to the second end of the high-voltage core, the method comprising the steps of:

flattening the wire loop into an elongated shape so that the width of the wire loop is smaller than the diameter of a bore hole extending through the first end wall,

inserting the wire loop through the bore until the elongated wire loop is inside the tube;

expanding the elongated wire loop to a desired form which is transverse to the resonating path; and

positioning the wire loop of desired form so that it is in proximity to the first side of the optical element and the laser resonating path passes through the wire loop.

18. (Amended) A method for installing a [dedusting] dust repelling unit for a laser optical element of a gas laser comprising a tube having a first end wall at one end and a second end wall at the other end and defining a cavity for containing a laser gas, a laser resonating path substantially parallel to the longitudinal axis of the tube and along which coherent light can resonate, and a laser optical element disposed in the laser resonating path and having a first side exposed to the cavity formed by the tube, wherein the first end wall has a port aligned with the resonating path and a bore hole for installing the [dedusting] dust repelling unit therethrough, and the optical element is mounted to the first end wall in alignment with the port, and wherein the [dedusting] dust repelling unit for the optical element comprises (1) a high-voltage duct comprising a high-voltage conducting core having a first end and a second end and an insulator element disposed around the core having an outer diameter which is less than the diameter of the bore hole, the first end of the core being connectable to a high voltage power supply, and (2) a closed wire loop electrically connected to the second end of the high-voltage core and having a diameter greater than the diameter of the bore, the method comprising the steps of:

flattening the wire loop into an elongated shape so that the width of the wire loop is smaller than the diameter of the bore;

inserting the [dedusting] dust repelling unit, wire loop end first, through the bore until the elongated wire loop is inside the tube and at least a portion of the high-voltage duct is within the bore;

expanding the elongated wire loop to a desired form which is transverse to the resonating path; and

positioning the wire loop of desired form so that it is in proximity to the first side of the optical element and the laser resonating path passes through the wire loop.

19. (Amended) A method for installing a [dedusting] dust repelling unit for a laser optical element of a gas laser comprising a tube with a first end wall and a second end wall and a bore hole extending through the first end wall, wherein the [dedusting] dust repelling unit for the optical element comprises (1) a high-voltage duct comprising a high-voltage conducting core having a first end and a second end and an insulator element disposed around the core having a diameter which is less than the bore hole in the first end wall of the tube, the first end of the core being connectable to a high voltage power supply, and (2) a flattened closed wire loop electrically connected to the second end of the high-voltage core having a diameter smaller than the bore diameter, but which is capable of being expanded to a diameter greater than the bore diameter, the method comprising the steps of:

inserting the wire loop through the bore until the elongated wire loop is inside the tube;

expanding the elongated wire loop to a desired form which has a diameter greater than the bore diameter and which is transverse to a laser resonating path that is substantially parallel to the longitudinal axis of the tube; and

positioning the wire loop of desired form so that it is in proximity to an optical element disposed in the laser resonating path and so that the laser resonating path passes through the wire loop.